

CLAIMS

1. A spray or injection device (1) making it possible to deliver at least two preset doses of product, comprising:
- a container (2, 50) containing the product to be sprayed or to be injected,
 - a plunger (4, 53, 60) placed in this container (2, 50) which is able to move in this container (2, 50) in order to extract the product from the container (2, 50),
 - a casing (6) in which the container (2, 50) is placed,
 - a pusher (5) which can be moved with respect to the casing (6) to allow the relative movement of the container (2, 50) and of the plunger (4, 53, 60), and
 - means (17, 33, 36, 37) making it possible to subdivide the length of travel of the pusher (5) with respect to the casing (6) into at least two travel portions, each one corresponding to the delivery of a dose of product;
- the device (1) being characterized in that:
- the casing (6) or the pusher (5) comprises at least one tab (17) which can be moved radially between a first normal radial position, in which the tab (17) provides no obstacle to the movement of the pusher (5) with respect to the casing (6), and a second radial position, in which the tab (17) provides an obstacle to this movement, this tab (17) comprising a pressing region (17a) and a nonpressing region (22);
 - the pusher (5) or the casing (6), respectively, comprises at least one ramp-shaped projection (33), against which said pressing region (17a) of the tab (17) comes to bear during the movement of the pusher (5) with respect to the casing (6) in the direction allowing the product to be sprayed or injected, which brings said tab (17) into said second radial position, then opposite which comes said nonpressing region (22) of the tab (17), which allows said tab (17) to return

to said first radial position; the pusher (5) or the casing (6), respectively, further comprises at least one stop region (36) against which the tab (17) presses when it is brought into said second radial position by
5 said projection (33), this pressure occurring just before said projection (33) comes opposite said nonpressing region (22),
the device (1) being designed such that the release of the force exerted on the pusher (5), which allows this
10 pusher (5) to move with respect to the casing (6), makes it possible to free the pressure of the tab (17) against said stop region (36) and therefore allows said tab (17) to return to said first radial position, said projection (33) then coming opposite said nonpressing
15 region (22), this return of said tab (17) to said first radial position making it possible to free the movement of the pusher (5) for a following portion of length of travel, for the purpose of spraying or injecting a following dose of the product.

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2. The device (1) as claimed in claim 1, characterized in that said nonpressing region of the tab (17) is formed by a window (22) made in the tab (17) set back from the end of this tab, said pressing
25 region being formed by the region (17a) of this tab connecting this end of the tab and this window (22).

3. The device (1) as claimed in claim 1 or claim 2, characterized in that it comprises at least two tabs
30 (17), two projections (33) and two stop regions (36), which are diametrically opposed.

4. The device (1) as claimed in one of claims 1 to 3, characterized in that the casing (6) and the pusher (5)
35 comprise means (20, 21, 38) making it possible to form at least one "hard point" having to be crossed at the start of delivering a dose.

5. The device (1) as claimed in claim 4, characterized in that said means making it possible to form at least one "hard point" consist of at least one lug (20, 21) projecting laterally from a tab (17) as mentioned above and of at least one boss (38) made in a suitable corresponding location of the casing (6).

6. The device (1) as claimed in one of claims 1 to 5, characterized in that the whole pusher (5) is made from a slightly flexible common plastic, the mobility of each tab 17 resulting from the flexibility of this material, no tab (17) being deformed in said first radial position and each tab (17) being elastically deformed in said second radial position.

7. The device (1) as claimed in one of claims 1 to 6, characterized in that each tab (17) has a distal head (17a) with projecting edges, forming, with a complementary means comprised in the casing (6), snap-fastening means making it possible to prevent the separation of the pusher (5) from the casing (6) after the engagement of the pusher in the casing.

8. The device (1) as claimed in one of claims 1 to 7, characterized in that the casing (6) comprises two walls (25, 26) defining between them a space (27) in which the pusher (5) is designed to be engaged so that it can slide, each projection (33) which projects from the outer face of the inner wall (25) and the outer wall (26) comprising at least one return (35) forming, inside said space (27) and at a preset distance from the projection (33), said stop region (36), each return (35) further comprising an opening (37) which allows the tab (17) to pass therethrough by sliding.

9. The device (1) as claimed in one of claims 1 to 7, characterized in that the casing (6) comprises two walls (25, 26) defining between them a space (27) in which the pusher (5) is designed to be engaged so that

it can slide, the pusher (5) comprising an inner wall (70), in which each stop region (36) is made, and an outer wall (71) comprising each projection (33), this outer wall (71) extending beyond each projection (33) and being engaged in said space (27), said inner (70) and outer (71) walls of the pusher (5) defining each opening (37) between them; each tab (17) is made in said inner wall (25) of the casing (6).

10 10. The device (1) as claimed in one of claims 1 to 9, characterized in that the container is formed by a syringe body (2) comprising a proximal collar (10) and a distal flow conduit, this syringe body (2) comprising a spray nozzle (3) fitted onto its distal end, which forms a spray head (11) making it possible to spray the product contained in the syringe body (2).

11. The device (1) as claimed in one of claims 1 to 9, characterized in that it comprises a container (50) with a proximal bottom (51), a plunger (53) having a thinned central region, a hollow needle (54) suitable for piercing this thinned central region, and a rod (55) held on the casing (6), this rod (55) comprising the needle (54) and forming a flow conduit (56) for the product.

12. The device (1) as claimed in one of claims 1 to 9, characterized in that it comprises a container (50) with a proximal bottom (51), a plunger (60) comprising an axial recess (61) which opens out into the distal face of the plunger (60) and which is made on one side of this plunger (60), this recess (61) thus defining a side wall portion (60a) of this plunger (60) having flexibility in the radial direction of the plunger, and a rod (55) held on the casing (6), forming a flow conduit (56) for the product, this rod (55) being suitable for pressing against the plunger (60) during movement of the pusher (5) with respect to the casing (6).

13. A spray or injection device (1) for spraying or injecting a product of interest, in liquid form, making it possible to deliver at least a first and a second
5 preset dose of said product in succession, said device extending along a reference axis from a distal end to a proximal end, comprising:
- an axially elongate container (2, 50) containing said product,
 - 10 - a plunger (4, 53, 60) placed in the container and blocking off the latter, said piston being axially moveable with respect to the container, in a reference direction, allowing said product to be propelled distally from the container,
 - 15 - a casing (6) designed to accommodate and axially secure said container,
 - a pusher (5) assembled with the casing (6), moveable with respect to the latter, designed to come into axial and proximal abutment against the container
20 or the plunger, and to move said plunger in the reference direction,
 - means (17, 33, 36, 37) for controlling the length of travel of the pusher with respect to the casing, these means being designed to divide this travel into a
25 first travel portion and a second travel portion, determining the respective delivery of the first and second doses, said device being characterized in that the casing (6) and the pusher (5) are designed to be axially moveable one with respect to the other in a
30 pushing direction, generating the movement of the plunger in the reference direction, *and*

- ~~14. The device as claimed in claim 13, characterized~~
in that the control means comprise:
- 35 - at least one tab (17) arranged on the pusher (5) or the casing (6), able to move between a first, unstressed, normal position in which said tab does not block the axial movement of the pusher, and a stressed, flexed, second position in which said tab halts the

axial movement of the pusher, said tab at its free end comprising a pressing region or element (17a) designed to contribute both to the halting of the axial movement of the pusher (5) and to the flexing of the tab (17)

5 under the effect of the axial movement of the pusher,

- at least one ramp (86) cooperating with said tab from an end known as the initial end (86a) to an end known as the final end (86b) and arranged respectively on the casing (6) or on the pusher (5), against which

10 the pressing region or element (17a) of said tab (17) bears in the direction of pressure of said pusher (5), said ramp being designed to bring said tab from its normal first position to its flexed second position,

- at least one stop (36) cooperating with the

15 pressing region or element (17a) of the tab (17), arranged respectively on the casing (6) or the pusher (5), respectively beyond or before the final end (86b) of the ramp (86) in the direction of pressure, against which the pressing region or element (17a) of the tab

20 (17) finally abuts in its flexed second position,

- at least one nonpressing region or opening (22) which is either arranged on the tab (17) before or beyond said pressing region or element (17a), depending on whether said tab is arranged on the pusher (5) or on

25 the casing (6), or arranged on the casing (6), before the stop (36) when the tab (17) is arranged on the pusher (5) and the pressing element (17a) cooperates with a hollowed ramp (86) formed on the casing, said nonpressing region or opening (22) being designed to

30 allow said pressing region or element (17a) to return to its unstressed normal position from the halted and flexed position of the tab 17 when the pressure on the pusher (5) is released,

- the first portion of travel of the pusher (5)

35 being determined by the movement of this pusher as far as its axial stop position, following contact between the pressing region or element (17a) and the stop (36), and the second portion of travel being determined by the movement of the pusher beyond the axial position in

which the nonpressing region or opening (22) has accommodated the pressing region or element (17a).

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14 ~~15~~. The device as claimed in claim ~~14~~, characterized
5 in that the flexed second position of the tab is obtained by radial stress.

¹⁴
15 ~~16~~. The device as claimed in claim ~~15~~, characterized
in that the tab (17) arranged on the pusher (5) or the
10 casing (6) comprises a nonpressing window (22) set back with respect to said pressing region or element (17a); the ramp (86) belongs to a projection (33) arranged respectively on the casing (6) or the pusher (5) and designed to pass freely through said window (22); the
15 stop (36) is arranged such that, in the flexed second position of said tab, the projection (33) faces the window (22) of the tab, then penetrates through said window when the pressure on the pusher (5) is released, thus causing said tab to return to its first position.

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¹³
16 ~~17~~. The device as claimed in claim ~~14~~, characterized
in that the flexed second position of the tab is obtained by tangential stress.

¹⁶
25 ~~17~~ ~~18~~. The device as claimed in claim ~~17~~, characterized
in that the tab (17) is arranged on the pusher (5), at its free end comprises a stud (17a) extending transversely toward the casing (6), an anterior cut (84, 85) to said tab allowing it to deflect
30 tangentially from its first, normal, position to its second, flexed, position, the ramp (86) is arranged on the casing (6), designed with a hollow to accommodate the stud (17a), and extends more or less obliquely in the wall of the casing, from the initial end (86a) to
35 the final end (86b); the stop (36), cooperating with the stud (17a), arranged on the casing (6) beyond the final end (86b) of the ramp (86) is determined by the joint, at an angle, but with continuity, of said ramp (86) with a ramp return (90); the nonpressing region or

opening (22), arranged in a hollow on the casing (6) before the stop (36) is designed to accommodate the stud (17a) when the tab (17) returns to its normal position; and an axial slot (91) extends, continuous
5 with the nonpressing region (22), beyond the latter.

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18 ~~18~~. The device as claimed in claim ~~18~~, characterized in that the axial slot (91) opens out freely into a through opening (92) in the casing (6), the second
10 portion of travel of the pusher (5) being determined by the abutment of the plunger (4) against the wall of the container (2).

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19 ~~20~~. The device as claimed in claim ~~18~~, characterized in that, before the initial end (86a) of the ramp (86), and continuous with the latter, there is formed a housing (93) in which to park the stud (17a), particularly to allow definitive assembly of the pusher
15 (5) and of the casing (6).

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20 ~~21~~. The device as claimed in claim ~~18~~, characterized in that, beyond the nonpressing region or opening (22), and continuous with the latter, there is formed a housing (94) in which to park the stud (17a).

¹³
25 ~~22~~. The device as claimed in claim ~~14~~, characterized in that, on the one hand, it comprises at least one tongue (87) distinct from or independent of the tab (17), arranged on the pusher (5) or the casing (6)
30 depending on whether the tab (17) is arranged on the pusher (5) or on the casing (6), able to move between an unstressed normal first position in which said tongue does not impede the axial movement of the pusher (5) and a stressed flexed second position in which said
35 tongue (87) contributes to returning the pusher (5) to allow said tab (17) to return to its normal position, from its flexed and halted position, and, on the other hand, the ramp (86) and the free end (87a) of the tongue (87) are designed to cooperate with one another

so that, during the first portion of travel of the
pusher, the tongue is flexed and during the second
portion of travel of the pusher, the tongue (87)
escapes from the ramp and returns to its normal
5 position.

22 ~~23~~²¹. The device as claimed in claim ~~22~~²¹, characterized
in that the flexed second position of the tongue (87)
is obtained by radial stress when the flexed second
10 position of the tab (17) is obtained by radial stress.

23 ~~24~~²¹. The device as claimed in claim ~~22~~²¹, characterized
in that the flexed second position of the tongue (87)
is obtained by tangential stress when the flexed second
15 position of the tab (17) is obtained by tangential
stress.

24 ~~25~~²². The device as claimed in claim ~~23~~²², characterized
in that the tab (17) arranged on the pusher (5) or the
20 casing (6) comprises a nonpressing window (22), the
ramp (86) belongs to a projection (33) arranged
respectively on the casing (6) or on the pusher (5) and
designed to pass freely through said window (22); the
stop (36) is arranged in such a way that, when said tab
25 is in the flexed second position, the projection (33)
faces the window (22) of the tab then penetrates
through said window when the pressure on the pusher (5)
is released, thus causing said tab to return to its
first position.

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25 ~~26~~²⁴. The device as claimed in claim ~~25~~²⁴, characterized
in that, on the one hand, the tongue (87) is arranged
at the center of the window (22), the free end (87a) of
the tongue (87) remaining before the head (17a) and
35 comprising two ears (88) for pressing against the ramp
(86) and, on the other hand, the ramp (90) comprises
two flanges (331) and (332) arranged one on each side
of a slot (89) allowing the tongue free passage in
translation, each ear (88) coming into contact with a

ramp portion (86) defined by a flange (331, 332) in the direction of pressure of the plunger (5) so as to escape from said ramp portion beyond the first portion of travel of the pusher (5).